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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/709,930	09/09/96	GREEN	P 000287-00482

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TOWNSEND AND TOWNSEND AND CREW LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO CA 94111

EXAMINER	
GARLAND, S	

ART UNIT	PAPER NUMBER
2786	22

DATE MAILED: 02/11/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)
	08/709930	Green
	Examiner	Group Art Unit
	Garland	2786

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication .
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

☑ Responsive to communication(s) filed on 5/10/99, 5/28/99, 6/7/99, 7/14/99.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☑ Claim(s) 106-146 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☑ Claim(s) 144-146 is/are allowed.

☑ Claim(s) 106-118, 122-135, 137-143 is/are rejected.

☑ Claim(s) 119-121, 136 is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 11 9(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 1 7.2(a)).

*Certified copies not received: _____.

Attachment(s)

☑ Information Disclosure Statement(s), PTO-1449, Paper No(s). 21

☐ Interview Summary, PTO-413

☑ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

DETAILED ACTION

1. The request filed on 5/28/99 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 08/709,930 is acceptable and a CPA has been established. An action on the CPA follows.

2. Claims 120-126, 131, 139 and 141 are objected to because of the following informalities:

Claims 120-126, 131 and 141 contain terminology preceded by "the" or "said" which is either inconsistent with its previous recitation or not previously introduced using "a" or "an" as appropriate.

The terminology upon which the objection is being based is as follows:

Claim 120, lines 1-2, "the articulable surgical instrument";

Claim 122, line 1, "the tool";

Claim 123, line 11, "said robotic arm";

Claims 124-126, are objected to for the reason given for parent claim 123;

Claim 131, line 1, "the articulatable surgical instrument"; and,

Claim 141, lines 1 and 3, "said control means" and in line 2, "said input means".

Additionally, in claim 139, line 4, "liner" should be --linear--.

Appropriate correction is required.

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the

following is required: the "shaft" referred to in the claims (see claim 114, line 4, for example) lacks antecedent basis in the specification.

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 106-112, 115, 122, 131, and 138-141 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In regards to claim 106 and its dependent claims 107-112, the originally filed disclosure does not support the specific limitations recited in newly added claim 106, lines 3-4, of "a first articulate arm which has a passive joint that is coupled to a first end effector inserted into the incision" because, the originally filed disclosure does not teach or suggest use of a passive joint. The disclosure as filed recites on page 16, lines 17-21; page 19, lines 2-7; and page 21, lines 29-35 that a variety of manipulators and hand control means can be used, but these sections only provide general guidance and do not teach the above specific limitations (i.e. "passive joint"). In fact the embodiment on page 17, line 15 to page 18, line 8, corresponding to figure 11 uses actively driven joints as opposed to the newly claimed passive joint. Note elements 182, 184, 186, and 188.

Further in regards to dependent claim 108, the additional specific limitations of moving the endoscope about a third pivot point are not set forth in the original specification. First page 14, lines 27-33, are directed to a different disclosed embodiment (figure 9) which is not used in combination with the embodiment of figure 11 which applicant argues supports parent claim 106. Secondly the laparoscope in figure 9 does not pivot or it is not disclosed to pivot. See page 14, lines 27-33. Additionally control means to control the endoscope to pivot in the claimed manner is not disclosed at all. Finally page 21, lines 8-14, state that other laparoscopes can be used, but none of the claimed limitations with respect to a third pivot point are disclosed.

In regards to newly added claim 115, the original disclosure does not support the claimed limitations of "computing an incremental movement based on the command provided by the user and on the original position of the surgical instrument." The specification on page 20, line 35, to page 21, line 6, states that the operator's hand motion is remapped to control the end effector or merely scales the operator's hand motion to control the end effector with none of the above specific claimed limitations being disclosed. The originally filed disclosure fails to teach or suggest basing the command on the initial position, but instead merely provides a remapping to mirror the operator's hand motion.

In regards to claim 122, as dependent on claim 120, the disclosure as filed does not support the limitation of a tool attached to the articulate surgical instrument. Claim 120 requires that the instrument have a base, a pivot linkage, and a distal end. The specification and the embodiment of figure 11 do not support the limitations of an articulable surgical instrument

comprising a base, a pivot linkage, and a distal end with the tool attached at the distal end of the articulable surgical instrument being a cauterizer. Page 14, lines 21-26, merely list different elements which can be used, but not the above mentioned specific features being claimed. The description of figure 11 on page 17, lines 15-17, discloses the use of jaws on a pivotable wrist, but again not the specific limitations being claimed. The same type of comments given for claim 122 apply to claim 131 which is dependent on claim 129 and requires an articulable surgical instrument comprising a forearm, a wrist, and an end effector and wherein the articulable surgical instrument comprises an electrosurgical coagulator which is not supported by figure 11; page 14, lines 21-26; or page 17, lines 15-17.

In regards to newly added claim 138 and its dependent claims 139-141, the original disclosure does not support the claimed limitations of "computes a movement of said instrument based on said command and on the original position of said mechanism" set forth in claim 138. The specification on page 20, line 35, to page 21, line 6, states that the operator's hand motion is remapped to control the end effector or merely scales the operator's hand motion to control the end effector with none of the above mentioned specific claim limitations being disclosed. The originally filed disclosure fails to teach or suggest basing the command on the initial position, but instead merely provides a remapping to mirror the operator's hand motion.

In addition to the reason set forth above with respect to claim 138, the original disclosure also does not support the specific limitations recited in claim 139, lines 2-5, of a "first linkage arm coupled to the surgical instrument and a first actuator which can rotate said first linkage arm

and the surgical instrument in a plane perpendicular to a first z axis, said first actuator being coupled to a liner actuator which can translate said first actuator along an axis parallel with the first z axis." Page 21, lines 15-35, state that various types of actuators including linear actuators can be used, but does not teach the specifics of a first actuator which can rotate the first linkage arm and the surgical instrument in a plane perpendicular to a z axis with the first actuator being coupled to a linear actuator which can translate the first actuator along an axis parallel with the z axis, as now claimed.

In addition to the reasons set forth with respect to claims 138 and 139, the original disclosure does not support the limitations in claim 140, lines 1-6, of "a first actuator sensor that is coupled to said linear actuator and provides a first feedback signal which corresponds to a location of said first actuator on the first z axis, and a second actuator sensor that is coupled to said first actuator for providing a second feedback signal which corresponds to location of the surgical instrument in the plane perpendicular to the first z axis." Page 21, lines 15-35, teach that various sensors can be used, but do not teach or suggest first and second sensors coupled to their respective actuators to generate feedback signals corresponding to the location of the first actuator on the z axis and to the location of the surgical instrument in a plane perpendicular to the first z axis, as now claimed.

6. Claims 138-141 are rejected under 35 U.S.C. 135(b) as not being made prior to one year from the date on which U.S. Patent No. 5,524,180 was granted.

U.S. Patent 5,524,180 to Wang et al. claims substantially the same subject matter as is now being claimed in claims 138-141. The 5,524,180 patent issued on June 4, 1996 more than a year before instant claims were first presented in the amendment of 7/14/99. The claims of U.S. Patent 5,524,180 bars the claim to substantially the same subject matter under 35 U.S.C. 135(b). See In re McGrew 43 USPQ2d 1633 (Federal Circuit 1997) which is particularly relevant.

Comparing instant claim 138 to claim 15 of the 5,524,180 patent, the claims are almost identical and are directed to system that allows a user to control movement of a surgical instrument, wherein the surgical instrument is coupled to a display device that displays an object, comprising:

a mechanism that moves the surgical instrument, said instrument having an original position;

an input device that receives a command to move the surgical instrument in a desired direction relative to the object displayed by the display device; and a controller that receives said command to move the surgical instrument in the desired direction, computes a movement of said mechanism based on said command and the original position of said mechanism so that the surgical instrument moves in the desired direction, and provides output signals to said mechanism to move said mechanism said computed movement to move the surgical instrument in the desired direction commanded by the user.

The only differences are that patent claim 15 states that the surgical instrument has a tip and that the motion is "incremental movement" instead of the more general "movement" of instant claim 138 .

Claim 15 of the patent is the same or substantially the same as newly added claim 138 of the instant application, since a surgical instrument inherently has a tip, and the movement as claimed in new claim 138 is an incremental movement, since it is based on an original position and a directional movement from that original position.

The additional limitations recited in instant claims 139-141 are identical to the additional limitations of claims 20, 21, and 26 respectively of patent 5,524,180 and no further explanation as to the common subject matter being claimed is believed necessary.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 106 and 107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al. 5,279,309 (cited by applicant) in view of Wilk 5,217,003 (cited in office action of 6/1/98).

In regards to claims 106 and 107, Taylor et al. teaches a medical robotic system that can be inserted through two incisions (fig. 8 and col. 19, lines 44-55) during a laparoscopic operation. Taylor teaches using two arms (col. 19, lines 44-55, a single arm is shown in figure 4), a arm has a passive joint (214) that is coupled to an end effector (236,237). In regards to the passive joint, Taylor in col. 17, lines 28-43, states that three of the four rotational sections are provided with drivers , and since no driver is provided for the fourth rotational section it is passive. Note also col. 7, lines 26-27; col. 12, lines 15-34 and lines 57-61; col. 13, lines 24-27; col. 15, line 31 to col. 17, line 47; and col. 19, line 36 to col. 20, line 68.

Taylor et al., however, do not explicitly teach a control system used to control the two manipulators, only stating (col. 19, line 50) that each can be connected to a separate manipulator.

Wilk teaches the use of two input devices (48,50) connected to a computer to control two surgical robots. See the figure and note the discussion in col. 3, lines 19-40.

It would have been obvious to one of ordinary skill in the art to modify Taylor et al. by incorporating the teachings of Wilk to use separate input units connected to a computer to control the two surgical manipulators in Taylor et al. This would allow ease in control of the robots and reduce operator confusion about which robot is being controlled, since each input device would

be used to control a single manipulator in a dual manipulator system, as taught by Wilk, and both Taylor et al. and Wilk are directed to improving surgical procedure precision through use of machine assistance for the surgeon.

10. Claims 113, 114, 116, 117, 123, 124, 127-130, 132, 133, 137, 142 ,and 143 are rejected under 35 U.S.C. 102(e) as being anticipated by Wilk 5,217,003.

See the figures; col. 1, line 51 to col. 2, line 16; col. 2, line 33 to col. 3, line 64; and the claims. Note in particular col. 2, lines 44-61; col. 3, lines 19-40; and the claims.

In regards to claim 113, Wilk discloses a first articulate arm and end effector (col. 2, lines 48-61), a first input device (col. 3, lines 19-40), and a computer (element 22 and col. 3, lines 35-40).

In regards to claim 114 which is dependent on claim 113, Wilk discloses pivot able motion about an incision in response to an input command (col. 2, lines 52-53; col. 6, lines 25-31) and use of a display element 46.

In regards to claim 116, Wilk discloses control of a surgical instrument having an end effector at a remote worksite (col. 2, lines 48-61; col. 3, lines 13-18), inputting a command and computing a movement based on the command (col. 3, lines 19-40) and inherently the surgical instrument always moves in the direction commanded by the operator.

In regards to claim 117 which is dependent on claim 116, the surgical instrument pivots about a pivot point located at an incision point in the patient (col. 2, lines 52-53; col. 6, lines 25-31).

In regards to claim 123, Wilk discloses a first articulate arm (col. 2, lines 48-61), a controller (22 and col. 3, lines 35-40), an input device (col. 3, lines 19-40), cutting an incision (col. 2, lines 34-37), a surgical instrument attached to the arm (col. 2, lines 48-61), inserting the instrument into the patient (col. 2, lines 48-56, col. 4, lines 23-24), generating input commands (col. 3, lines 35-40) and inherently when the operation is completed the surgical instrument is removed from the patient.

In regards to claim 124 which is dependent on claim 123, Wilk discloses a grasper 20.

In regards to claim 127, Wilk discloses an arm (14) and an endoscopic surgical instrument (element 20 and col. 2, lines 48-61), an input device having a handle (joystick element 60 and col. 3, lines 19-40), and movement of at the input device using the joystick or slide switch inherently produces a proportional movement in the arm and surgical instrument. Note the claim only requires movement at the input device which may or may not require movement of the handle.

In regards to dependent claim 128 which is dependent on claim 127, Wilk discloses an articulable endoscopic surgical instrument (forceps 20) as in claim 128.

In regards to claim 129 which depends on claim 128, Wilk discloses a forearm, a wrist, and an end effector as follows element 21 are forceps jaws which serve as the end effector, forceps instrument 20 has a forearm, the instrument rotates and jaws close which requires the use of a wrist.

In regards to claim 130 which is dependent on claim 129, Wilk discloses movement at the input device results in a corresponding movement of the end effector relative to the forearm in col. 2, lines 48-61; and col. 3, lines 30-40.

In regards to claim 132, Wilk discloses a first articulate arm (col. 2, lines 48-61), a computer (22 and col. 3, lines 35-40), an input device (col. 3, lines 19-40), forming an incision (col. 2, lines 34-37), a surgical instrument attached to the arm (col. 2, lines 48-61), inserting the instrument into the patient (col. 2, lines 48-56, col. 4, lines 23-24), generating input commands (col. 3, lines 35-40) and inherently when the operation is completed the surgical instrument is removed from the patient

In regards to claim 133 which is dependent on claim 132, Wilk discloses a grasper 20.

In regards to claim 137 which is dependent on claim 132, Wilk discloses generating input commands and use of a display (col. 3, lines 7-18 and 35-40) and pivoting a shaft of the surgical instrument (col. 2, lines 52-53 and col. 6, lines 25-31).

In regards to claim 142, Wilk discloses the use of a display (46), a mechanism that moves the surgical instrument (24), an input device (col. 3, lines 19-40) and a computer (22 and col. 3 lines 35-40), that responsive to the command forming outputs signals to move the mechanism and the instrument (col. 3, lines 35-40).

In regards to claim 143 which is dependent on claim 142, Wilk discloses an articulable endoscopic surgical instrument (forceps) with a shaft, a wrist, and an end effector (element 21 are forceps jaws on a forceps instrument 20 which has a shaft, the instrument rotates and jaws close

which requires the use of a wrist) and the mechanism (24) pivots the instrument about a pivot point located along the shaft (col. 2, lines 52-53 and col. 6, lines 25-31).

11. Claims 125 and 134 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilk 5,217,003 in view of Putman 5,184,601.

In regards to parent claim 123 of claim 125, Wilk discloses a first articulate arm (col. 2, lines 48-61), a controller (22 and col. 3, lines 35-40), an input device (col. 3, lines 19-40), cutting an incision (col. 2, lines 34-37), a surgical instrument attached to the arm (col. 2, lines 48-61), inserting the instrument into the patient (col. 2, lines 48-56, col. 4, lines 23-24), generating input commands (col. 3, lines 35-40) and inherently when the operation is completed the surgical instrument is removed from the patient.

In regards to parent claim 132 of claim 134 , Wilk discloses a first articulate arm (col. 2, lines 48-61), a computer (22 and col. 3, lines 35-40), an input device (col. 3, lines 19-40), forming an incision (col. 2, lines 34-37), a surgical instrument attached to the arm (col. 2, lines 48-61), inserting the instrument into the patient (col. 2, lines 48-56, col. 4, lines 23-24), generating input commands (col. 3, lines 35-40) and inherently when the operation is completed the surgical instrument is removed from the patient

Wilk however does not teach the use of a cauterizer or coagulator and a cutting blade, but Wilk does teach that other surgical instruments can be used. (col. 2, lines 44-47).

Putman teaches the use of a dissector and an electrocautery instrument during a laparoscopic procedure. See col. 1, lines 43-45 and lines 63-65. The electrocautery instrument inherently performs a coagulating function.

In regards to claims 125 and 134, it would have been obvious to one of ordinary skill in the art to modify Wilk in view of Putman and provide a dissector blade and an electrocautery instrument in the apparatus of Wilk, such instruments being useful in typical laparoscopic surgical procedures, as taught by Putman, and consistent with the suggestion of use of surgical instruments other than forceps contained in Wilk.

12. Claims 126 and 135 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilk 5,217,003 in view of the article by A.M. Sabatini et al. " Force feedback based telemicromanipulation for robot surgery of soft tissues " .

In regards to parent claim 123 of claims 126, Wilk discloses a first articulate arm (col. 2, lines 48-61), a controller (22 and col. 3, lines 35-40), an input device (col. 3, lines 19-40), cutting an incision (col. 2, lines 34-37), a surgical instrument attached to the arm (col. 2, lines 48-61), inserting the instrument into the patient (col. 2, lines 48-56, col. 4, lines 23-24), generating input commands (col. 3, lines 35-40) and inherently when the operation is completed the surgical instrument is removed from the patient.

In regards to parent claim 132 of claims 135 , Wilk discloses a first articulate arm (col. 2, lines 48-61), a computer (22 and col. 3, lines 35-40), an input device (col. 3, lines 19-40), forming an incision (col. 2, lines 34-37), a surgical instrument attached to the arm (col. 2,

lines 48-61), inserting the instrument into the patient (col. 2, lines 48-56, col. 4, lines 23-24), generating input commands (col. 3, lines 35-40) and inherently when the operation is completed the surgical instrument is removed from the patient

Wilk however does not teach the use of a cutting blade, but Wilk does teach that other surgical instruments can be used. (col. 2, lines 44-47).

Sabatini et al. teaches the use of a scalpel moved by a robot to perform surgery. See the description of figure 1.

In regards to claims 126 and 135, it would have been obvious to one of ordinary skill in the art to modify Wilk in view of Sabatini et al. and provide a scalpel with a cutting blade in the apparatus of Wilk, such an instrument being useful in cutting during typical laparoscopic surgical procedures, as taught by Putman, and consistent with the suggestion of use of surgical instruments other than forceps contained in Wilk

13. Claim 113 is rejected under 35 U.S.C. 102(b) as being anticipated by Matsen, III et al. 4,979,949.

Matsen, III et al. discloses a medical robotic system with an articulate arm and an end effector (figs 7-10); an input device and a computer (fig. 14). See col. 9 line 41 to col. 10, line 17; col. 13, line 20 to col. 14, line 31.col. 16, lines 32-43; col. 17, line 27 to col. 18, line 55; col. 28, line 42-to col. 29, line 1; and claim 4.

14. Claims 113 and 142 are rejected under 35 U.S.C. 102(e) as being anticipated by Kwoh 5,078,140.

See figs. 1, 2a; col. 5, line 18 to col. 7, line 51; and col. 8, lines 3-11.

In regards to claim 113, Kwoh discloses an articulate arm with an end effector (figs 1, 2a, col. 5, lines 18-22), a first input unit and a computer (col. 5, line 41 to col. 6, line 16; col. 6, line 44 to col. 7, line 51).

In regards to claim 142, Kwoh discloses the use of a display (col. 6, lines 44-62), a mechanism to move the instrument (figs. 1, 2a, col. 5, lines 18-22), an input device and a computer (col. 5, line 41 to col. 6, line 16; col. 6, line 44 to col. 7, line 51).

15. Claims 118, 123, 126, 127, 132, and 135 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwoh 5,078,140 in view of the article by A.M. Sabatini et al. " Force feedback based telemicromanipulation for robot surgery of soft tissues."

In regards to claim 118, Kwoh teaches a robotic surgery system comprising a robot with an articulated arm (fig. 1); a coupler (21) that holds the instrument and pivots; that endoscopic instruments can be used (col. 8, lines 3-11); a controller and input device (col 5, lines 41-59).

Kwoh however does not disclose the use of a handle on the input device or state that proportional movement is produced.

Kwoh does state that buttons are used in a manner similar to a joystick (col. 7, lines 45-51).

A.M. Sabatini et al. in the description of figure 1 teaches the use of a joystick (i.e., a controller with a handle) to produce proportional movement of a surgical robot.

It would have been obvious to one of ordinary skill in the art to modify Kwoh in view of Sabatini and use a joystick to produce proportional movement in the surgical robot. This would allow ease in control of the robot and also reduce the number of buttons and therefore likelihood of an incorrect control being input, a joystick being more intuitive than numerous buttons.

In regards to claims 123 and 126, Kwoh teaches a robotic surgery system comprising a robot with an articulated arm (fig. 1); a controller and input device (col 5, lines 41-59), a coupler (21) that allows the instrument to be attached to the arm, generating input commands to move the instrument (col. 5, lines 41-59; and col. 6, line 67 to col. 7, line 1) and inherently the surgical instrument is removed from the patient when the operation is completed.

Kwoh however does not expressly state that an incision is formed by cutting so that an instrument such as a cannula can be inserted.

Sabatini et al. teach the use of a scalpel moved by a robot to perform surgery. See the description of figure 1.

It would have been obvious to one of ordinary skill in the art to modify Kwoh in view of Sabatini et al. and use a scalpel moved by the robot arm to cut an incision in the patient so that an cannula or endoscopic instrument could be inserted into the patient and a surgical operation performed.

In regards to claim 127, Kwoh teaches a medical robotic system comprising an articulated arm (fig. 1); that endoscopic instruments can be used (col. 8, lines 3-11); a coupler (21) that holds the instrument; a controller and an input device (col 5, lines 41-59).

Kwoh however does not disclose the use of a handle on the input device or state that proportional movement is produced.

It would have been obvious to one of ordinary skill in the art to modify Kwoh in view of Sabatini and use a joystick to produce proportional movement in the surgical robot for the reasons stated above with regard to claim 118.

In regards to claims 132 and 135, Kwoh teaches a robotic surgery system comprising a robot with an articulated arm (fig. 1); a computer and input device (col 5, lines 41-59), a coupler (21) that allows the instrument to be attached to the arm, generating input commands to move the instrument (col. 5, lines 41-59; and col. 6, line 67 to col. 7, line 1).

Kwoh however does not expressly state that an incision is formed so that an instrument such as a cannula can be inserted.

Sabatini et al. teaches the use of a scalpel moved by a robot to perform surgery.

It would have been obvious to one of ordinary skill in the art to modify Kwoh in view of Sabatini et al. and use a scalpel moved by the robot arm to cut an incision in the patient for the reasons stated above with regard to claims 123 and 126.

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Glassman et al. 5,086,401, and the articles by S. Lavalle, B. Preising et al., and Bergamasco et al. are of interest in medical robotics. Wang et al. 5,841,950 and its claims 10-16 are of interest in medical robot positioning.

17. Claims 106-112; 115; 118, 122-126; and 138-141 of this application has been copied by the applicant from U. S. Patent Nos. 5,762,458; 5,878193; 5,855,583; and 5,815,640 respectively. These claims are not patentable to the applicant because of the reasons set forth above .

18. Claims 144-146 are allowable.

19. Claims 119-121 and 136 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Garland whose telephone number is (703) 305-9759. The examiner can normally be reached on Monday-Thursday from 6:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Grant, can be reached on (703) 308-1108. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-9051.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

WILLIAM GRANT
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2700
2/11/00

APPROVED:
JOSEPH J. ROLLA
DIRECTOR, GROUP 2700